



INDIAN SCHOOL SOHAR
UNIT TEST I (2022-23)
PHYSICS THEORY (042)

No. of printed pages: 03
SET-A

CLASS: XII
DATE: 22/05/2022

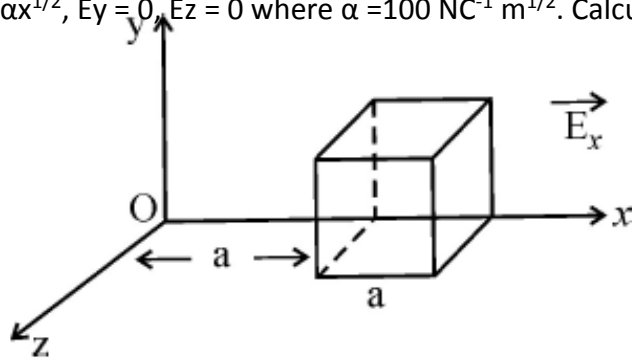
Max Marks: 20
Duration: 45 minutes

General Instructions:

- (i) There are 13 questions in all. All questions are compulsory.
- (ii) This question paper has three sections: Section A, Section B, Section C and Section D.
- (iii) Section A contains 5 MCQ of **one mark** each, Section B contains two questions of **two marks** each, Section C contains two questions of **three marks** each Section D contains one case study-based question of five marks.

SECTION A		
1	A charge Q is supplied to a metallic conductor. Which is true? a) Electric field inside it is same as on the surface. b) Electric potential inside is zero. c) Electric potential on the surface is zero d) Electric potential inside it is constant	1
2	A point charge $+q$, is placed at a distance d from an isolated conducting plane. The field at a point P on the other side of the plane is a) directed perpendicular to the plane and away from the plane. b) directed perpendicular to the plane but towards the plane. c) directed radially away from the point charge. d) directed radially towards the point charge.	1
3	The electric flux through the surface: <div style="text-align: center;"></div> a) in Figure (iv) is the largest. b) in Figure (iii) is the least. c) in Figure (ii) is same as Figure (iii) but is smaller than Figure (iv). d) is the same for all the figures.	1
4	Figure shows electric field lines in which an electric dipole p is placed as shown. Which of the following statements is correct?	

9	Define electric flux and write its SI unit. The electric field components in the figure shown are: $E_x = \alpha x^{1/2}$, $E_y = 0$, $E_z = 0$ where $\alpha = 100 \text{ NC}^{-1} \text{ m}^{1/2}$. Calculate the charge within the cube, assuming $a = 0.1\text{m}$.	3
---	---	---

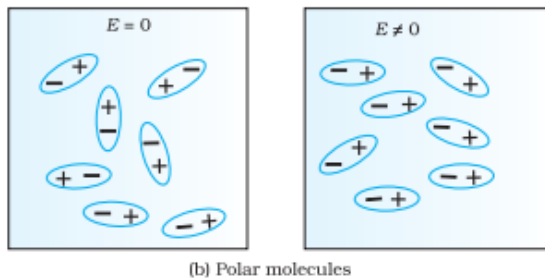


SECTION D

CASE STUDY:

Read the following text and answer the following questions on the basis of the same:

Dielectric with polar molecules also develops a net dipole moment in an external field since the individual dipole moments tend to align with the field. When summed overall the molecules, there is then a net dipole moment in the direction of the external field, i.e., the dielectric is polarized. The extent of polarisation depends on the relative strength of two factors: the dipole potential energy in the external field tending to align the dipoles mutually opposite with the field and thermal energy tending to disrupt the alignment. Thus in either case, whether polar or non-polar, a dielectric develops a net dipole moment in the presence of an external field. The dipole moment per unit volume is called polarisation.



10	Define Polarisation.	1
11	Polarisation causes the electric field in the dielectrics decreases: True/False?	1
12	Electric field inside the capacitor is 50 V/m and the dielectric constant = 4.5. What is polarisation?	1
13	In the circuit shown, initially K_1 is closed and K_2 is open. What are the charges on each capacitor? Then K_1 was opened and K_2 was closed (order is important), what will be the charge on each capacitor now? [$C = 1\mu\text{F}$]	2

